

Windows or OS/2?

The Choice is Clear

*Windows from Desktops
to the Enterprise*

Microsoft Customer Commitment

- ❖ **Investment Protection**
- ❖ **Competitive Advantage**
- ❖ **Minimize Risk**

Microsoft Customer Commitment

Evaluation Criteria for Desktop and Server Operating Systems

- ❖ Leverage existing hardware and software investment
- ❖ Deliver product features which meet customer requirements
- ❖ Lower support costs
- ❖ Provide broad industry support and a clear path to future technologies

Evaluation Criteria

- ➡ **❖ Leverage existing hardware and software investment**
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Leverage Existing Investment

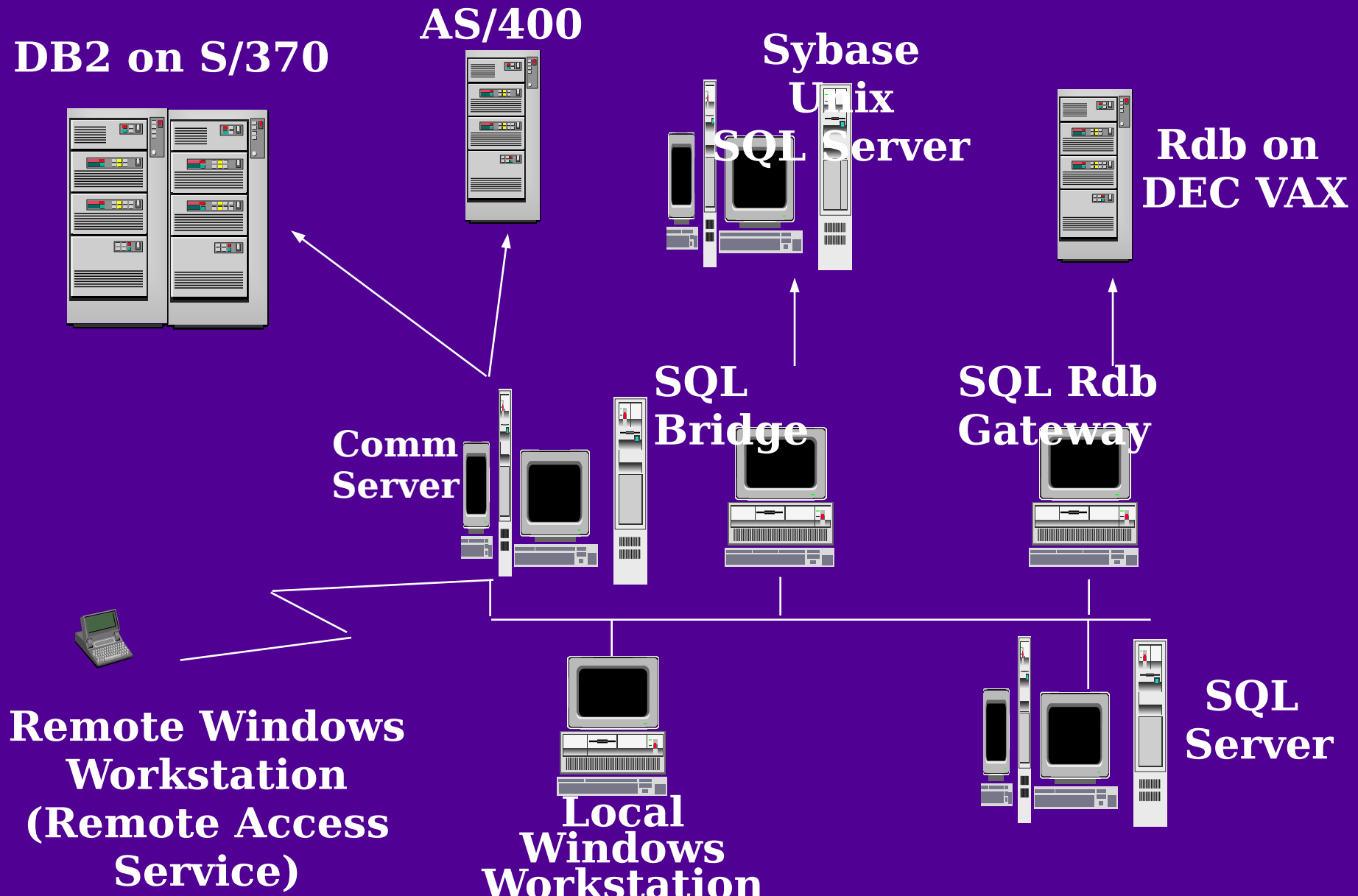
System Requirements

Resource	Windows 3.1	Windows for Workgroups	OS/2 2.0	Windows NT Final
Processor	286+	386	386/25+	386/25+
RAM (MB)	2+	3-4+	8+	8+
HD Space for OS (MB)	6.5	9.0	30.0*	31.0*

* Plus additional space for Swap File

Leverage Existing Investment

Integration with Enterprise Computing Resources



Evaluation Criteria

- ❖ Leverage existing hardware and software investment



- ❖ **Deliver product features which meet customer requirements**

- ❖ Lower support costs

- ❖ Provide broad industry support and a clear path to future technologies

OS Feature Requirements

General Desktop Platform

Requirement	Windows for Workgroup s	OS/2 2.x
Run DOS apps		Yes
Run Windows 16-bit apps		Standard mode only, performance degradation
Run GUI 32-bit apps	Yes	PM 32
Multitask DOS apps	Yes	Yes
Multitask Windows 16-bit apps	Win32s	Yes
Multitask GUI 32-bit apps	Yes	Yes
Error checking for Windows apps	Yes	Yes
Scaleable outline fonts	Yes	No
OLE support	Yes	Adobe
Built-in multimedia support	TrueType	Partial support
	Yes	No
Built-in file/printer sharing	Yes	No
Built-in email/scheduling	Yes	No
	Yes	

OS Feature Requirements

Advanced Desktop/Server Platform

Requirement	Windows NT	OS/2 2.0
Run DOS applications		Yes
Run Windows 16-bit applications	Yes	Yes
Run GUI 32-bit applications	Yes	PM 32
POSIX application support	Win32	No
	Yes	
Preemptive Multitasking		Yes
Multithreaded Multitasking for 32-bit applications	Yes	Yes
	Yes	No
Full 32-bit internal operation	Yes	No
Full 32-bit I/O	Yes	Yes
Separate address space for applications	Yes	No
Separate message queue for applications	Yes	
		No
Portable to RISC platforms	Yes	No
Symmetric Multiprocessing support	Yes	No
C2-level security support	Yes	No
Built-in multimedia support	Yes	No
Built-in file/printer sharing	Yes	No
Built-in email and scheduling	Yes	No
Built-in Remote Administration tools	Yes	Yes
SNA & Netview support	Yes	No
TCP/IP & Sockets included	Yes	

OS Feature Requirements

Performance

❖ Windows application performance

Publication	Test Results
Software Digest (NSTL)	Windows performs better
PC Magazine	Windows performs better
PC Computing	Windows performs better
BYTE Magazine	Windows performs better
InfoWorld	Windows performs better

(1) *National Software Testing Laboratories*, Microsoft Windows versus IBM OS/2, Volume 9, Number 4 (9/92)

(2) *PC Magazine*, Windows versus OS/2; Will the New Standard Please Stand Up?, November 10, 1992

(3) *PC Computing*, OS/2: See How It Runs, October, 1992

(4) *BYTE Magazine*, OS/2: A Mixed Blessing, August, 1992

(5) *InfoWorld*, Windows 3.1 versus OS/2 2.0, June 8, 1992

OS Feature Requirements

Performance

❖ “Windows runs Windows applications much better than OS/2” National Software Testing Laboratories (1)

Test Scenario	OS/2 Performance Penalty
Lotus Freelance Graphics: Draw 3 slides	2.2x
Lotus 1-2-3: Print Spreadsheet, return to application	5.5x
Lotus 1-2-3: Print Spreadsheet, page out	2.0x
Wordperfect 5.1 for Windows: Scroll through document	1.3x

(1) *National Software Testing Laboratories*, Microsoft Windows versus IBM OS/2, Volume 9, Number 4 (9/92)

OS Feature Requirements

Performance

❖ Windows application multitasking performance

Publication	Test Results
Software Digest (NSTL)	Windows performs better than OS/2
PC Magazine	Windows performs better than OS/2
PC Computing	Mixed
BYTE Magazine	Did not test
InfoWorld	Windows performs better than OS/2

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OS Feature Requirements

Performance

❖ Windows application multitasking performance

Test Scenario	OS/2 Performance Penalty
Win-OS/2 with 4MB RAM versus Windows 3.1 with 4MB RAM	3.9x
Seamless Win-OS/2 with 4MB RAM versus Windows 3.1 with 4MB RAM	6.8x
Win-OS/2 with 16MB RAM versus Windows 3.1 with 4MB RAM	1.3x
Seamless Win-OS/2 with 16MB RAM versus Windows 3.1 with 4MB RAM	1.4x

OS Feature Requirements

Performance

❖ **MS-DOS application performance**

- **“Although OS/2 runs DOS programs better than Windows, Windows still runs DOS programs well.” *NSTL* (1)**
- **“Performance of Wordperfect 5.1 for DOS under Windows was consistently better than under OS/2”. *PC Magazine* (2)**

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OS Feature Requirements

Application Support

Graphical Application Availability

Windows 16-bit	OS/2 16-bit	OS/2 32-bit
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Number of native GUI applications
available through leading software distributors

>400	8	1
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Availability of Top 3 Applications by Category

Accounting

Communication

Database

Forms

Graphics

Integrated

Project Management

Spreadsheets

Word Processing

3	0	0
3	1	0
3	0	0
3	0	0
3	1	0
3	0	0
3	0	0
3	2	0
3	1	0
>200k	?	released 10/92

Software Development Kits shipped

OS Feature Requirements

Windows Tools Support

❖ Analysis and Design

Mark V Objectmaker
Meta Software

❖ CASE

CGi PACBENCH
TI IEF

❖ Prototyping and Simulation

DemoSHIELD
Toolbook

❖ Code Generation

CASE: W
WindowsMaker

❖ Low-Level Development

Micro Focus COBOL
Microsoft FORTRAN

❖ High Level Development

Easel/Win
PowerBuilder

❖ Object-Oriented Environments

Borland

C++

Microsoft C/C++

❖ Customizable Applications

Lotus 1-2-3/W
Microsoft Word

❖ DBMS

Oracle Card
SQL Windows

❖ Testing

Automated Test Facility
Microsoft Test

❖ Others

Project Management
Version Control
Libraries and Custom
Controls *and many more*

OS Feature Requirements

Access to Corporate Data

IBM

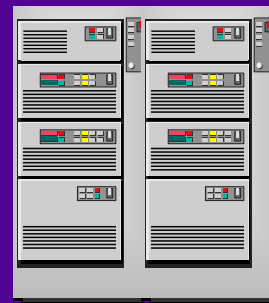
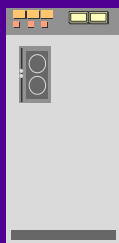
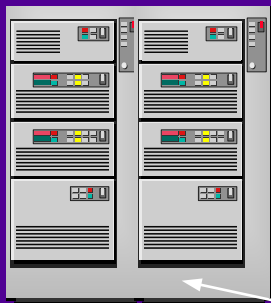
HP

DEC

UNIX

UNISYS

LANs



LAN
Manager
NetWare®
VINES®
Others

SNA, DECnet®, TCP/IP, OSI, XNS, IPX,
NetBEUI, Others



Windows, Windows for Workgroups,
Windows NT

Evaluation Criteria

- ❖ Leverage existing hardware and software investment
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- ❖ **Lower support costs**
- ❖ Provide broad industry support and a clear path to future technologies



Support Costs

Installation

❖ **Installing Windows 3.1 is much easier than OS/2 2.0**

Publication

**Software Digest
(NSTL)**

PC Magazine

PC Computing

PC World

Test Results

**Windows is much easier to
install**

**Windows is much easier to
install**

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Support Costs

Hardware Compatibility

- ❖ **OS/2 has significant compatibility problems with non-IBM hardware**
 - **“Windows ran without any problems on all but one of the 102 systems NSTL tested, while OS/2 presented problems ranging from minor complications to outright incompatibility on 25 systems.” *NSTL* (1)**
 - **“Installation on non-IBM hardware can be agonizing.....” *PC Magazine* (2)**
- ❖ **Hardware Certification is much broader for Windows:**

➤ Windows 3.1/Windows for Workgroups 3.1	>1200 PCs
➤ Windows NT (as of release of 10/92 beta) (excluding RISC & SMP systems)	>400 PCs
➤ OS/2 2.0 (as of 10/92)	260 PCs

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Support Costs

Hardware Compatibility

❖ Systems found by NSTL to have compatibility problems with OS/2 2.0:

Acer	Elonex	PC-Craft
ALR	Epson	Swan
AT&T	Gateway	Tristar
Compaq	IBM	Unisys
DEC	NCR	Xpro
DTK	Northgate	

❖ Systems found by NSTL to have compatibility problems with Windows 3.1

Tristar

Support Costs

Ease of Learning & Use

- ❖ **OS/2: Combining multiple User Interfaces on one desktop increases complexity**
 - **“OS/2 completely revamps the interface, and this adds to the learning curve.” (1)**
 - **“Windows in OS/2 gives the impression of two operating systems running concurrently, creating a cumbersome conflict between the two.” (1)**
 - **“[The Workplace Shell's] multiplicity of features make it harder to learn....” (2)**
 - **“Not recommended for average DOS/Windows users.” (3)**
- ❖ **OS/2: Win-OS/2 requires 2 separate configurations, adding to support burden**
 - **Separate printer, com port, mouse configuration**
 - **Separate network configuration**
 - **Separate desktop configuration**

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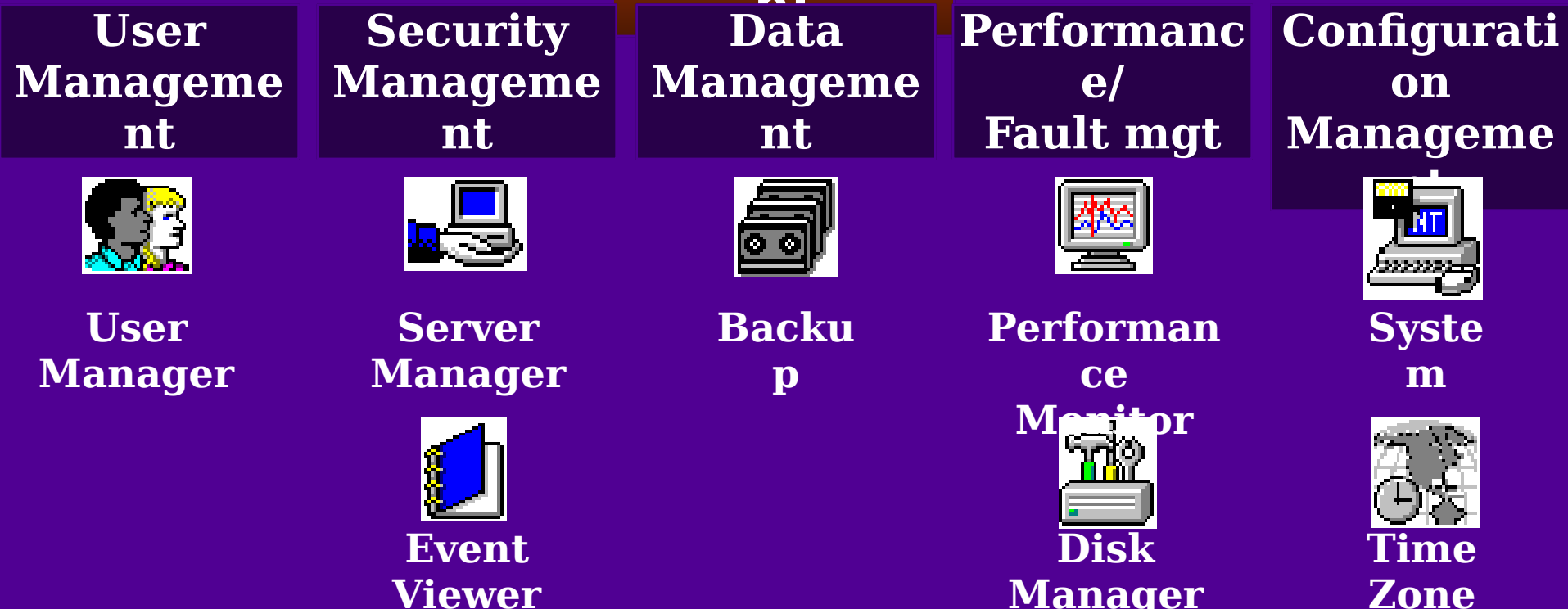
(3) *Byte Magazine*, OS/2 2.0: A Mixed Blessing, August 1992

Support Costs

Built-in Manageability with Windows NT



Windows NT Management



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Broad Industry Support

Application Support

❖ Annual Revenue Growth Rate

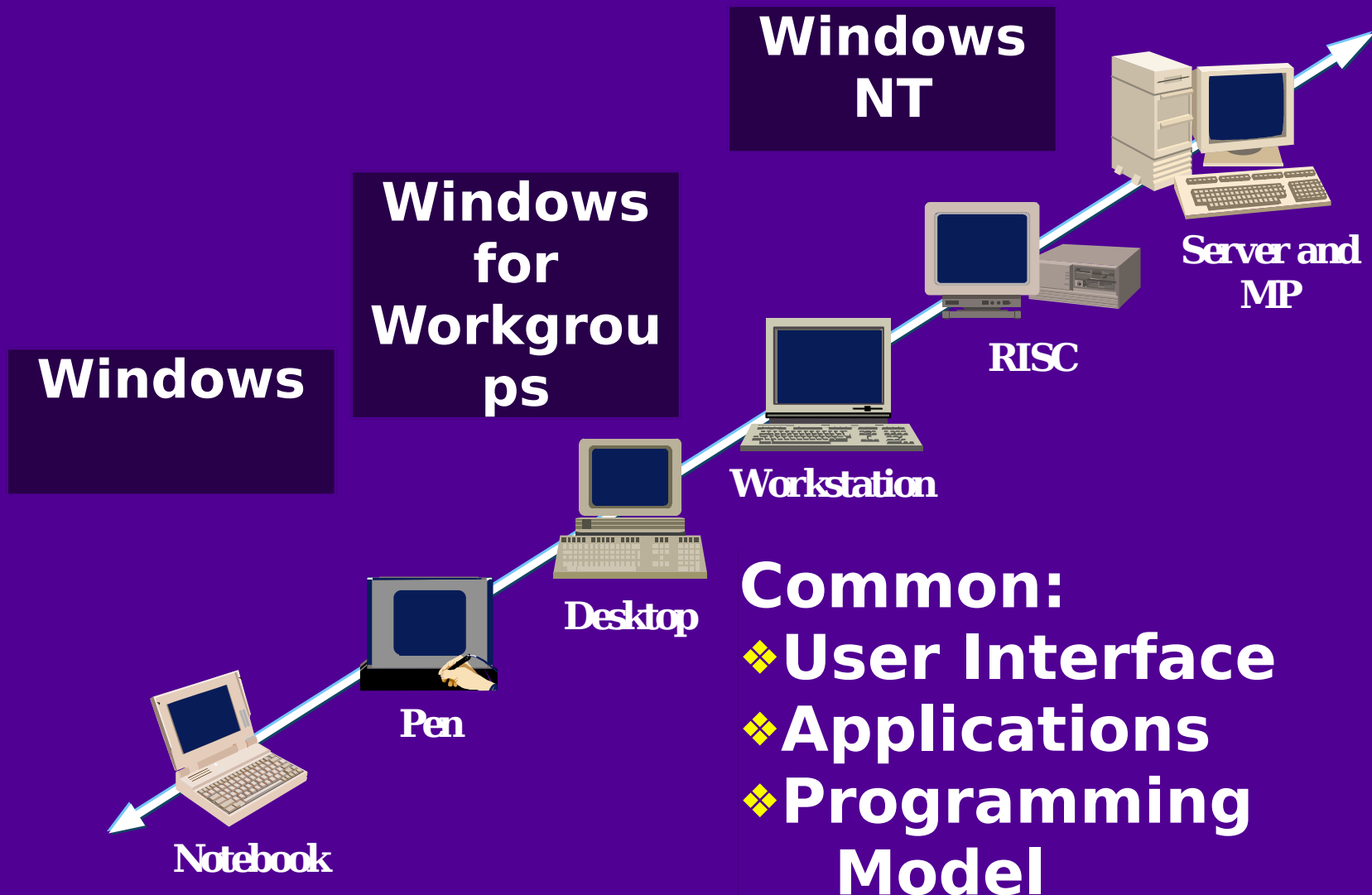
- **MS-DOS applications** (20)%
- **Windows applications** 242%
- **OS/2 applications** (65%)

❖ Relative Market Size

- **Windows vs. MS-DOS applications** 0.9X
- **Windows vs. OS/2 applications** 36.0X
- **Windows projected to pass MS-DOS in 3rd Qtr 1992**

A Clear Future

Windows Scalable Architecture



Windows NT Scalability

Power for Business Solutions

❖ Take advantage of powerful hardware for business solutions

- Servers (Database Servers, etc.)
- High-end desktops (CAD/CAM, Databases, etc.)

❖ Choice of hardware

- Intel 386, 486, Pentium
- R4000 systems
- DEC Alpha systems
- Symmetric Multiprocessing (14 systems today)

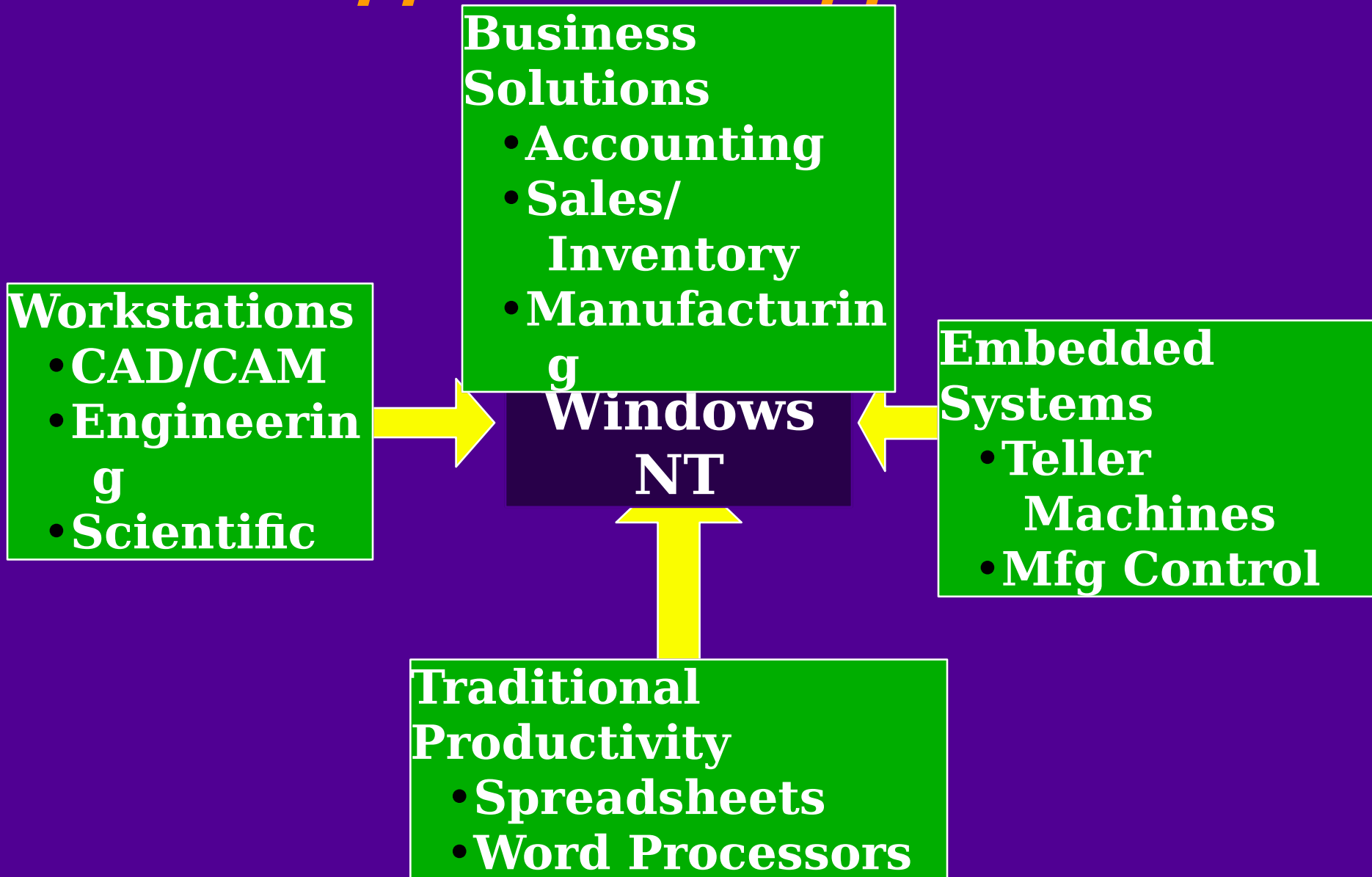


OS/2's Future?

- ❖ **No low-end (home, entry user, laptop)**
- ❖ **Not scalable**
 - **RISC**
 - **Symmetric Multiprocessing**
- ❖ **Can OS/2 grow and evolve as computing needs change?**
 - **Different Applications, UI, and Programmatic Model than**
 - **OS/400 (AS/400)**
 - **AIX (RS/6000)**
 - **Taligent ??**

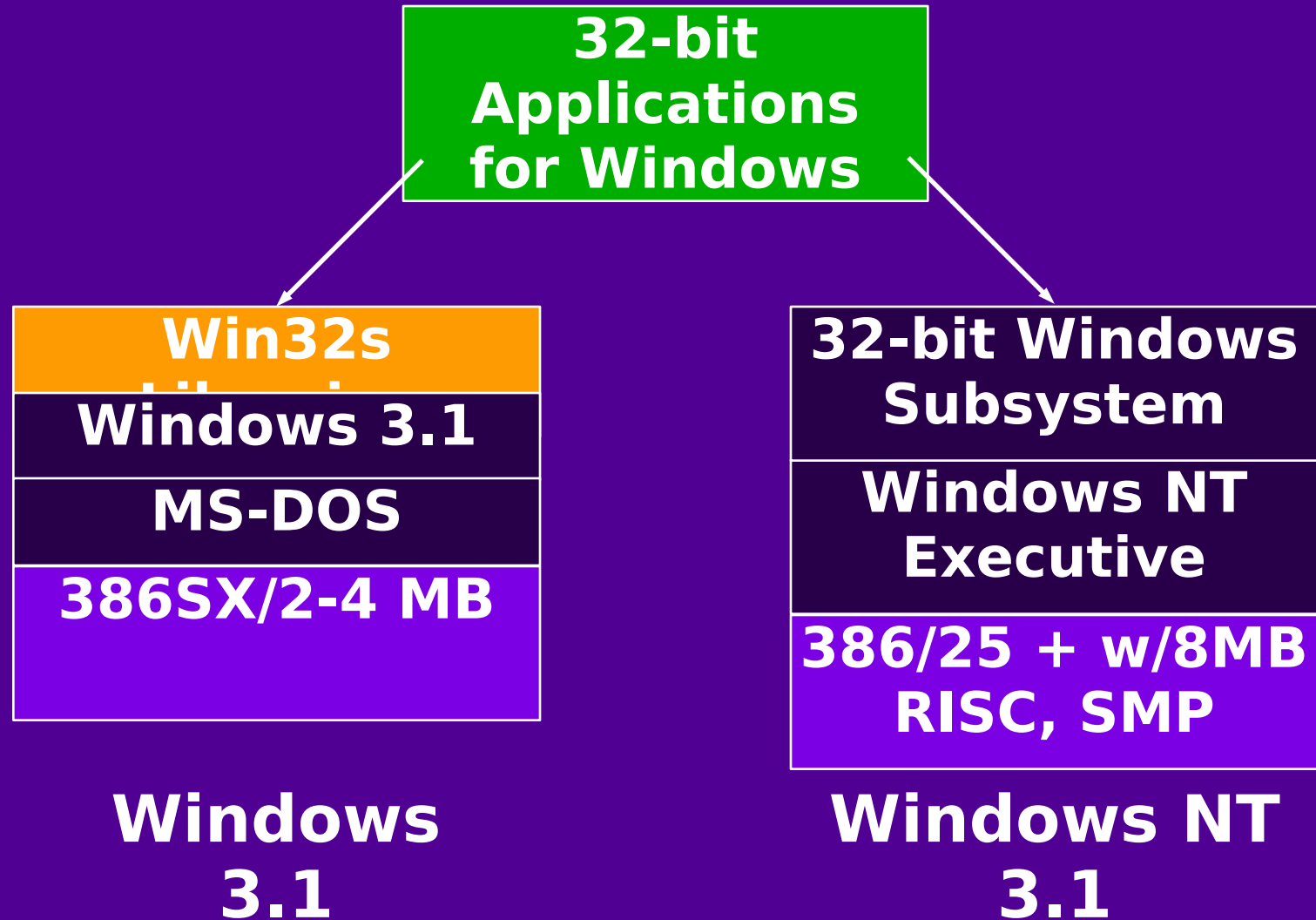
A Clear Future

New Applications Opportunities



A Clear Future

*Broad Base of 32-bit Applications
For Windows NT and Windows 3.1*



Broad Industry Support & A Clear Future

Windows 32-bit Application Development Momentum

- ❖ **Over 25,000 Win32 Software Development Kits shipped worldwide**
- ❖ **Over 100 hardware & software vendors demonstrating 32-bit products at Fall '92 Comdex**
- ❖ **Leading ISV's in Major Categories have shown 32-bit Windows Applications**
 - ***Server:*** Microsoft SQL Server, Microsoft SNA Services, Oracle, Ingres, XDB
 - ***CAD:*** Autocad, CAD X11, AMI Ultimate CAD, Computervision
 - ***Graphics/Imaging:*** Micrografx, Corel, Filenet, Imag-in, Optika
 - ***Desktop:*** FrameMaker, Microsoft Excel
 - ***Communications:*** Future Soft/NSA, Software Ventures, WallData
 - **Over 25 Development Tools from 22 Companies Shipping**

Broad Industry Support

Industry Momentum

- ❖ **Windows 3.x installed base over 16mm worldwide (9/30/92)**
- ❖ **Windows 3.1 run rate (excluding upgrades) over 1mm licenses per month**
- ❖ **All top OEM's shipping Windows 3.1 pre-installed with systems**
 - **100 OEM's with "Ready to Run" agreements**

Summary

Windows from Desktops to the Enterprise

- ❖ **Windows is the most compatible**
- ❖ **Windows meets customer requirements better**
- ❖ **Windows has lower support costs**
- ❖ **Windows is the business standard**